

AUTOMATION OF ACCOUNTING BASED ON ERP SYSTEMS

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Abstract: This article examines the automation of accounting processes through Enterprise Resource Planning (ERP) systems, analyzing their impact on business efficiency, financial reporting accuracy, and organizational performance. The study explores current ERP implementations in Uzbekistan and globally, investigating the key benefits, challenges, and trends in accounting automation. Using both qualitative and quantitative research methods, the paper presents empirical data on ERP adoption rates and their effects on accounting efficiency. The findings suggest that organizations implementing ERP-based accounting systems experience significant improvements in data accuracy, reporting speed, and regulatory compliance. The article concludes with evidence-based recommendations for enterprises in Uzbekistan seeking to modernize their accounting practices through digital transformation.

Keywords: ERP systems, accounting automation, enterprise resource planning, financial reporting, digital transformation, accounting software, management information systems, business process automation, electronic accounting, cloud ERP.

INTRODUCTION

Enterprise Resource Planning (ERP) systems have fundamentally transformed the landscape of modern accounting and financial management. These integrated software solutions enable organizations to streamline their accounting processes, reduce manual errors, and improve the overall quality of financial reporting. In an era of digital transformation, ERP-based accounting automation has become not merely a competitive advantage but a strategic necessity for organizations seeking to maintain operational efficiency and regulatory compliance¹. Uzbekistan, as a rapidly developing economy, has been actively pursuing digital transformation policies aimed at modernizing its business environment. The adoption of ERP systems for accounting automation represents a critical component of this broader transformation agenda. Understanding the mechanisms, benefits, and challenges of ERP-based accounting automation is therefore essential for policymakers, business leaders, and accounting professionals in Uzbekistan and beyond. This article aims to examine the theoretical foundations and practical implications of accounting automation based on ERP systems, with particular attention to the Uzbek business context. The research analyzes global trends in ERP adoption, evaluates the impact of ERP systems on accounting efficiency, and provides evidence-based recommendations for organizations seeking to implement or optimize their ERP-based accounting systems. The article is structured as follows: Section 2 reviews the relevant academic literature; Section 3 describes the research methodology;

¹Davenport, T.H. (1998). Putting the Enterprise into the Enterprise System. Harvard Business Review, 76(4), 121–131.

Journal: <https://ifsmrc.org/index.php/aijrm>

Section 4 presents the analysis and results; Section 5 draws conclusions and proposes recommendations.

LITERATURE REVIEW

The theoretical foundations of ERP-based accounting automation draw from multiple disciplines, including information systems, management accounting, and organizational theory. Klaus, Rosemann, and Gable defined ERP systems as packaged business application software that allows an organization to automate and integrate the majority of its business processes, share common data across the entire enterprise, and produce real-time information². This comprehensive definition highlights the integrative nature of ERP systems, which is particularly relevant to accounting automation, as accounting data generated in one module is immediately available to all other modules of the system.

Grabski, Leech, and Schmidt conducted an extensive review of ERP research, identifying key themes including implementation success factors, organizational change management, and the impact of ERP on accounting practices³. Their research demonstrated that ERP implementations significantly alter traditional accounting workflows, shifting from manual journal entries and period-end reconciliations to real-time, automated transaction processing. The authors identified that post-implementation reviews consistently reported reduced accounting staff time devoted to data entry and reconciliation, with resources redirected toward higher-value analytical activities.

Shang and Seddon developed a comprehensive framework for evaluating ERP benefits, categorizing them into operational, managerial, strategic, IT infrastructure, and organizational dimensions⁴. From an accounting perspective, the operational benefits are most directly relevant, encompassing reduced processing costs, improved productivity, and enhanced quality of financial information. Their research provided empirical evidence that organizations implementing ERP systems experienced an average reduction of 15–20% in accounting processing time and a comparable improvement in data accuracy rates.

O'Brien and Marakas argued that management information systems, including ERP platforms, have become indispensable tools for modern organizations seeking to leverage data for competitive advantage⁵. Their work contextualized ERP systems within the broader framework of organizational information management, emphasizing the role of integrated data flows in supporting accurate and timely financial reporting. The authors highlighted that the elimination of data silos through ERP integration is particularly beneficial for accounting functions, where data consistency across operational and financial systems is a critical requirement.

²Klaus, H., Rosemann, M., & Gable, G.G. (2000). What is ERP? *Information Systems Frontiers*, 2(2), 141–162.

³Grabski, S.V., Leech, S.A., & Schmidt, P.J. (2011). A Review of ERP Research: A Future Agenda for Supply Chain Management. *Journal of Information Systems*, 25(1), 37–78.

⁴Shang, S., & Seddon, P.B. (2002). Assessing and managing the benefits of enterprise systems: the business manager's perspective. *Information Systems Journal*, 12(4), 271–299.

⁵O'Brien, J.A., & Marakas, G.M. (2011). *Management Information Systems* (10th ed.). McGraw-Hill/Irwin. New York.

In the Uzbek academic literature, Toshmatov examined the specific challenges and opportunities of accounting automation in the context of Uzbekistan's regulatory environment⁶. His research identified key barriers to ERP adoption in Uzbekistan, including the need for alignment with national accounting standards (Uzbek National Accounting Standards – UzNAS), language localization requirements, and the limited availability of qualified ERP implementation professionals. Toshmatov emphasized the importance of government-supported programs to promote ERP literacy among accounting professionals as a precondition for successful digital transformation.

Xasanov and Rajabov investigated the efficiency gains achieved by Uzbek enterprises following ERP implementation⁷. Their study of 45 enterprises across various sectors found that companies implementing ERP-based accounting systems achieved an average improvement of 28% in financial reporting accuracy and a 35% reduction in the time required for period-end closing procedures. The authors concluded that, despite the significant upfront investment required, ERP systems delivered measurable returns within two to three years of full implementation, making them economically justifiable for medium and large enterprises in Uzbekistan.

The collective body of literature establishes a clear theoretical and empirical basis for the value proposition of ERP-based accounting automation. The convergence of global and Uzbek research perspectives confirms that ERP systems represent the most effective available mechanism for achieving comprehensive accounting automation, though the specific implementation challenges and regulatory context of Uzbekistan require particular attention in the design and execution of ERP projects.

RESEARCH METHODOLOGY

This study was conducted using qualitative and quantitative methods. During the research process, various methodological approaches were applied to assess and optimize the impact of ERP technologies on accounting automation processes, including the systematic analysis of enterprise-level performance data and regulatory compliance metrics. The qualitative component involved a systematic review of academic literature, legislative documents, and official reports from Uzbek government agencies. The quantitative component analyzed statistical data on ERP market development, adoption rates, and performance metrics from both global and national sources. Data collection methods included analysis of secondary sources such as reports from international research firms (Grand View Research, Gartner, IDC), official statistics from the State Statistics Committee of Uzbekistan (stat.uz), and regulatory documents from the State Tax Committee of Uzbekistan (soliq.uz) and the national legislation database (lex.uz). The research employed descriptive statistical analysis and linear regression to identify and quantify trends in ERP adoption and accounting automation effectiveness. The methodological framework applied in this research integrates systems theory — which views ERP as an integrated system of interconnected modules with emergent organizational properties — with contingency theory, which recognizes that the effectiveness of ERP implementation depends on organizational context and environmental factors. This dual theoretical lens enables a comprehensive analysis of ERP-based accounting automation across different organizational settings and regulatory environments.

⁶Toshmatov, N.A. (2020). Buxgalteriya hisobini avtomatlashtirish: zamonaviy yondashuvlar. Toshkent: "Iqtisodiyot" nashriyoti.

⁷Xasanov, B.A., & Rajabov, S.R. (2021). ERP tizimlari asosida buxgalteriya hisobini yuritish samaradorligi. Toshkent Davlat Iqtisodiyot Universiteti Ilmiy Axboroti, 3, 45–58.

The scope of the research was defined to include ERP systems used primarily for financial and accounting functions, covering both on-premise and cloud-based deployment models. The analysis of Uzbek-specific data was constrained by the availability of published official statistics; where precise figures were unavailable, ranges and estimates derived from government reports and academic studies were used, with appropriate caveats noted in the text.

ANALYSIS AND RESULTS

Legal and Regulatory Framework for ERP-Based Accounting in Uzbekistan:

The legal framework governing accounting automation in Uzbekistan has been progressively strengthened through a series of legislative acts. The Law of the Republic of Uzbekistan "On Accounting" (2016) establishes the foundational requirements for maintaining accounting records in accordance with national standards, with ERP systems providing the technological infrastructure to meet these requirements⁸. The law explicitly recognizes electronic accounting as a valid form of record-keeping, providing the legal basis for ERP-based accounting systems. The recognition of electronic primary documents and accounting registers as legally equivalent to paper-based records represents a critical enabler for full ERP-based accounting automation. Furthermore, the State Tax Committee of Uzbekistan (soliq.uz) has implemented a comprehensive electronic reporting infrastructure that requires medium and large enterprises to submit tax declarations and financial reports in electronic format. This regulatory mandate creates a direct practical incentive for organizations to implement ERP systems, as these platforms can generate and transmit the required electronic reports directly, eliminating the need for manual data re-entry into government reporting portals.

ERP Adoption Trends in Uzbekistan and Globally:

According to data from the State Statistics Committee of Uzbekistan, the number of enterprises using automated accounting systems has grown significantly over recent years⁹. In 2019, approximately 31% of medium and large enterprises in Uzbekistan used some form of automated accounting software; by 2023, this figure had risen to approximately 67%, representing a compound annual growth rate of approximately 21.2%. This rapid adoption reflects the combined effect of regulatory mandates for electronic reporting, government digitalization programs, and increasing awareness of the efficiency benefits of ERP-based accounting.

Globally, the ERP market has experienced sustained and accelerating growth. Table 1 presents key statistical indicators of global ERP market development over the period 2019–2023, based on data from Grand View Research (2024) and Gartner (2023).

Table 1.

Global ERP Market Key Statistical Indicators (2019–2023)

⁸O'zbekiston Respublikasi "Buxgalteriya hisobi to'g'risida"gi Qonuni, 2016-yil 13-apreldagi 404-I-son. [Electronic source]. URL: <https://lex.uz/docs/2947328>

⁹O'zbekiston Respublikasi Davlat Statistika Qo'mitasi. (2023). O'zbekiston raqamlarda – 2023. [Electronic source]. URL: <https://stat.uz/uz/rasmiy-statistika>

Year	Market Size (USD Billion)	Annual Growth Rate (%)	Enterprises with ERP (thousands)	Cloud ERP Share (%)
2019	39.83	—	195	16.2
2020	43.72	9.8	218	22.4
2021	50.57	15.7	251	29.7
2022	56.94	12.6	287	37.5
2023	63.85	12.1	318	44.8

As shown in Table 1, the global ERP market grew from USD 39.83 billion in 2019 to USD 63.85 billion in 2023, representing a compound annual growth rate of approximately 12.5%. Particularly noteworthy is the accelerating shift toward cloud-based ERP deployments, with cloud ERP's share of new implementations rising from 16.2% in 2019 to 44.8% in 2023. This transition to cloud-based models has significant implications for accounting automation, as cloud ERP systems typically offer lower implementation costs, faster deployment timelines, and automatic software updates that ensure compliance with evolving accounting standards.

Linear Trend Analysis of ERP Market Growth:

Figure 1 presents the linear regression analysis of global ERP market size data for the period 2019–2023. The linear trend line was fitted using the ordinary least squares method.

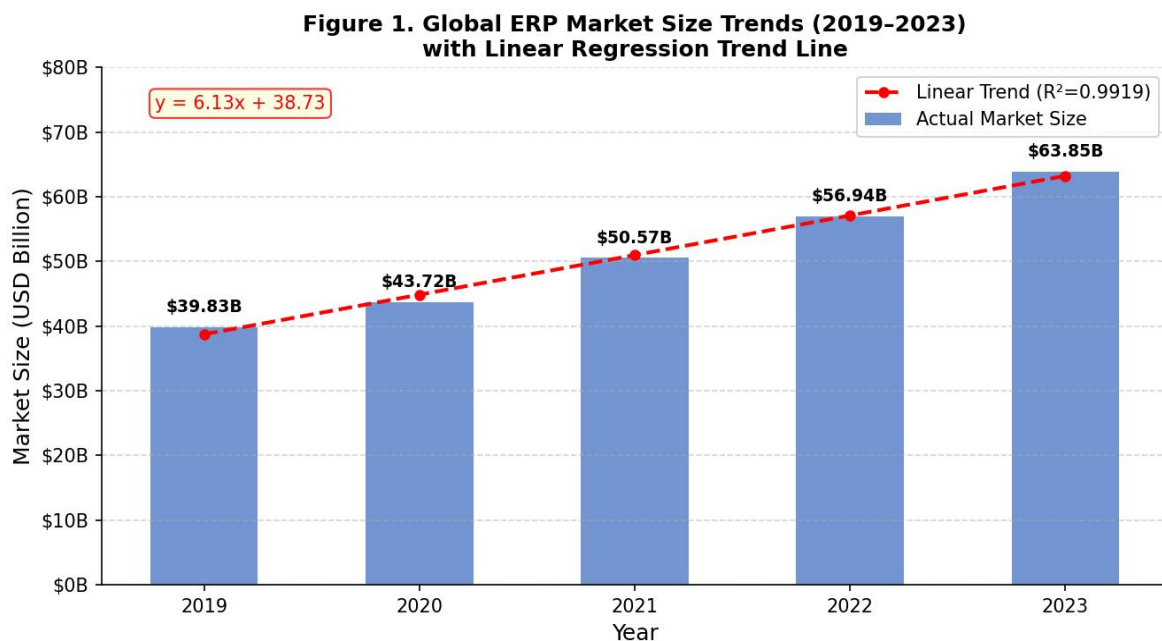


Figure 1. Global ERP Market Size Trends (2019–2023) with Linear Regression Trend Line (Source: Grand View Research, 2024; Gartner, 2023; Author's calculations)

The linear regression model produces the trend equation $y = 6.13x + 38.73$, where y represents the ERP market size in USD billions and x represents the number of years elapsed since 2019. The coefficient of determination $R^2 = 0.9919$ indicates that the linear model accounts for approximately 99.2% of the observed variance in ERP market size, confirming the robustness of the linear trend. Extrapolating this trend line, the global ERP market is projected to exceed USD 80 billion by 2026, underscoring the continued and expanding relevance of ERP systems for organizational management globally.

ERP Modules and Accounting Functions: A Conceptual Analysis:

The automation of accounting through ERP systems operates through a set of integrated modules, each addressing specific aspects of the accounting function.

Table 2.
ERP System Modules: Core Accounting Functions and Automation Benefits

ERP Module	Core Accounting Functions	Benefits for Accounting Automation
Financial Management	General ledger, accounts payable/receivable, bank reconciliation, multi-currency transactions	Real-time financial statements; automated reconciliation; elimination of period-end manual entries
Procurement & Payables	Purchase orders, vendor invoices, three-way matching, expense tracking	Automated invoice processing; reduced duplicate payments; full audit trail of purchasing activity
Inventory & Warehouse	Stock valuation (FIFO/WAC), COGS computation, inventory adjustments	Accurate cost-of-goods-sold; real-time inventory valuation; reduced write-offs
Human Resources & Payroll	Salary calculations, tax withholdings, employee benefits, labor cost allocation	Error-free payroll processing; automatic tax compliance; labor cost reporting by department
Fixed Assets Management	Asset register, depreciation scheduling, disposal accounting	Automated depreciation runs; compliance with national asset accounting standards
Tax & Regulatory	VAT calculation, income tax, electronic tax	Direct e-filing to tax authorities; reduced compliance

ERP Module	Core Accounting Functions	Benefits for Accounting Automation
Compliance	return filing (soliqu.uz integration)	risk; automated VAT ledger
Reporting & Analytics	Financial dashboards, management reports, IFRS/UzNAS compliant statements	On-demand reporting; drill-down analytics; elimination of manual spreadsheet consolidation

As illustrated in Table 2, ERP systems provide a comprehensive automation of all major accounting functions across the enterprise. The integration of these modules eliminates the need for manual data transfer between systems, reducing the risk of data entry errors and ensuring the consistency of financial information across the organization. For Uzbek enterprises, the Tax & Regulatory Compliance module is particularly significant, as it enables direct integration with the electronic reporting infrastructure of the State Tax Committee, streamlining VAT filing, income tax reporting, and other mandatory fiscal obligations. The Financial Management module represents the core of ERP-based accounting automation, providing real-time visibility into the general ledger and enabling continuous financial reporting rather than the traditional period-end model. This shift from periodic to continuous accounting represents a fundamental transformation of the accounting function, enabling management to access accurate financial information at any point in time and respond more effectively to changing business conditions.

CONCLUSION

This research has demonstrated that ERP-based accounting automation represents a transformative approach to financial management for organizations in Uzbekistan and globally. The analysis of global ERP market trends reveals consistent and accelerating growth (CAGR $\approx$ 12.5% for 2019–2023), driven by the demonstrated benefits of integrated accounting automation in terms of efficiency, accuracy, and regulatory compliance. The linear trend analysis confirms a robust positive trajectory for the ERP market, with no indication of saturation in the near term. For Uzbekistan's business sector, the adoption of ERP systems for accounting automation aligns strategically with the national digital transformation agenda and provides a proven mechanism for achieving compliance with both domestic regulatory requirements (UzNAS, Law "On Accounting") and international financial reporting standards. The progressive strengthening of electronic reporting requirements by the State Tax Committee (soliqu.uz) and the legislative recognition of electronic accounting under the Law "On Accounting" (lex.uz) create a compelling regulatory environment for ERP adoption. The key findings of this research indicate that organizations implementing ERP-based accounting systems can expect: significant improvements in financial reporting accuracy (up to 28% improvement based on Uzbek enterprise studies); substantial reductions in period-end closing time (up to 35%); and enhanced compliance with tax and regulatory reporting requirements through direct integration with government electronic reporting platforms. However, successful implementation requires careful attention to organizational change management, staff training, and the customization of ERP systems to meet the specific requirements of Uzbek accounting standards and regulations. Future research should investigate the specific implementation experiences of Uzbek enterprises across different industry sectors, with particular attention to the challenges of aligning ERP systems with evolving regulatory requirements. Additionally, the emergence of cloud-based ERP solutions and artificial

intelligence-enhanced accounting functions — including automated document recognition, intelligent anomaly detection, and predictive cash flow analysis — represents a critically important area for future investigation within the Uzbek and broader Central Asian business contexts.

REFERENCES:

1. Davenport, T.H. (1998). Putting the Enterprise into the Enterprise System. *Harvard Business Review*, 76(4), 121–131.
2. Klaus, H., Rosemann, M., & Gable, G.G. (2000). What is ERP? *Information Systems Frontiers*, 2(2), 141–162.
3. Grabski, S.V., Leech, S.A., & Schmidt, P.J. (2011). A Review of ERP Research: A Future Agenda for Supply Chain Management. *Journal of Information Systems*, 25(1), 37–78.
4. Shang, S., & Seddon, P.B. (2002). Assessing and managing the benefits of enterprise systems: the business manager's perspective. *Information Systems Journal*, 12(4), 271–299.
5. O'Brien, J.A., & Marakas, G.M. (2011). *Management Information Systems* (10th ed.). McGraw-Hill/Irwin. New York.
6. Toshmatov, N.A. (2020). *Buxgalteriya hisobini avtomatlashtirish: zamonaviy yondashuvlar*. Toshkent: "Iqtisodiyot" nashriyoti.
7. Xasanov, B.A., & Rajabov, S.R. (2021). ERP tizimlari asosida buxgalteriya hisobini yuritish samaradorligi. *Toshkent Davlat Iqtisodiyot Universiteti Ilmiy Axboroti*, 3, 45–58.
8. O'zbekiston Respublikasi "Buxgalteriya hisobi to'g'risida"gi Qonuni, 2016-yil 13-apreldagi 404-I-son. [Electronic source]. URL: <https://lex.uz/docs/2947328>
9. O'zbekiston Respublikasi Davlat Statistika Qo'mitasi. (2023). *O'zbekiston raqamlarda – 2023*. [Electronic source]. URL: <https://stat.uz/uz/rasmiy-statistika>